



UNITED STATES PATENT AND TRADEMARK OFFICE

4m

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/851,158

05/09/2001

Toshiyuki Shigaraki

862.C2224

2511

5514

7590

03/29/2004

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/851,158

Applicant(s)

SHIGARAKI, TOSHIYUKI

Examiner

Erik Kielin

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-9,11-16,19-24 and 26-35 is/are pending in the application.
- 4a) Of the above claim(s) 4-9,11-15,19-24 and 26-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This action responds to the Amendment filed 2 December 2004.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 16, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-186077 A (**Nakamura**; assigned to the same assignee as the instant application) in view of Semiconductor Equipment and Materials International (SEMI) publications **S2-0200** entitled, "Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment."

Regarding claims 1 and 16, **Nakamura** discloses a semiconductor manufacturing apparatus and method of using

a chamber **101** enclosing a main body of a semiconductor exposure apparatus (Figs. 1, 2, 6) --as further limited by instant claim 34 -- having a predetermined area inside the semiconductor exposure apparatus --as further limited by instant claim 35--

a purging means **2, 3** and purging step for purging inert gas in a predetermined area inside said chamber (paragraph [0017]);

setting means and setting step for setting a maintenance mode (paragraph [0035]);

a panel for maintenance **5C, 5D** provided in the outer wall of said chamber 101;

a sensor **4A**, **4B** for detecting an opening of said panel provided in an outer wall of the chamber; and

a sensor **14** for determining if the level of inert gas is at a safe level for an operator to perform maintenance (Abstract; paragraphs [0023], [0027], [0034] through [0037], and [0044]).

It would appear to be inherent that there exists a supplying means and supplying step for providing air based upon the output of the sensor indicating that the inert gas is at an unsafe level since, in the absence of such supply, the sensor could never indicate that the inert level was safe for the operator to perform maintenance. This would be contrary to the teaching in Nakamura.

However, in the event that it is thought that Nakamura does not teach a supplying means and supplying step for supplying clean, dry air based upon an output of a sensor that detects an opening in a maintenance panel, when the maintenance mode has been set, then this may be a difference.

S2-0200 states on p. 6,

“6.1 A primary objective of the [semiconductor manufacturing] industry is to eliminate or control hazards during the equipment’s life cycle (i.e., the installation, operation, **maintenance**, **service**, and disposal of equipment).” Note that “equipment” is defined therein as “a specific piece of machinery, apparatus, process module, or device used to execute an operation.” (See p. 3, section 5.2.11. Emphasis added.)

S2-0200 further states on p. 7,

“6.9.2 *Incorporate Safety Devices* -- If identified hazards cannot be eliminated or their associated risk adequately controlled through design selection, then the risk should be reduces through fixed, automatic, or other protective safety design features or devices.” (Section 6.9.2; emphasis in original.)

“6.9.3 *Provide Warning Devices* -- If design or safety devices cannot effectively eliminate identified hazards or adequately reduce associate risk, a means should be used to detect the hazardous condition

Art Unit: 2813

and to produce a warning signal to alert personnel of the hazard.” (Section 6.9.3; emphasis in original.)

In section 22 entitled “**22 Exhaust Ventilation**” (emphasis in original), pp. 24 and 25, **S2-0302** states,

“22.1.2 As supplemental control when intermittent activities (e.g. chamber cleaning, implant housing cleaning) present potentially hazardous chemical exposures to employees which cannot reasonably be controlled by other means[, s]upplemental exhaust hood or enclosures may be integrated into equipment design, or supplied completely by the equipment user.”

“22.1.2.1 When a procedure (e.g., cleaning) specified by the supplier requires exhaust ventilation, the supplier should include minimum criteria for exhaust during the procedure.”

“22.2 Equipment exhaust ventilation should be designed and a ventilation assessment conducted ...to control, efficiently and safely, for potential worst-case, realistic employee exposures to chemicals during normal operation, maintenance, or failure of other equipment components (hardware or software).”

“22.4.1 When the exhaust falls below the prescribed set point, an alarm should be provided within audible or visible range of the operator, and the process equipment should be placed in a safe stand-by mode... The system should be capable of interfacing with the facility alarm system.”

(1) Because 6.1 states that hazards during maintenance and service should be prevented, (2) because 22.2 indicates that sufficient exhaust ventilation must be provided during maintenance, and (3) because 22.1.2 and 22.1.2.1 indicate that the absence of oxygen or the presence of hazardous gases in the maintenance areas of a semiconductor apparatus are to be prevented (i.e. are life threatening) by using adequate exhaust ventilation, it would have been obvious for one of ordinary skill in the art at the time of the invention, to provide a gas containing oxygen during maintenance in **Nakamura**, because oxygen is required for human life and because flowing gas containing oxygen can flush away or dilute toxic gases to safer levels,

as suggested by the sections indicated in **S2-0200** should be provided during maintenance, and because **Nakamura** indicates that the inert gas should be decreased to a safe level.

Although the air provided by the exhaust ventilation in **S2-0200** is not indicated to be clean and dry, it would have been obvious for one of ordinary skill in the art, at the time of the invention, to provide clean, dry air in **Nakamura**, as opposed to contaminated, wet air, in order to ensure the safety of the employees and to prevent contamination to the semiconductor apparatus, which is absolutely essential in the semiconductor fabrication art to prevent damage to the apparatus and to the semiconductor device to be manufactured therein.

Response to Arguments

3. Applicant's arguments filed 2 December 2004 have been fully considered but they are not persuasive.

Applicant argues that the SEMI manual is directed to exhausting hazardous chemicals and does not teach supplying clean dry air. Examiner respectfully disagrees. First, an atmosphere absent of oxygen (i.e. an inert gas atmosphere) is a hazardous chemical atmosphere, because it will cause suffocation, which is clearly life threatening. Moreover, note that "in considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968) See also *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976). In this case, the SEMI guide is the definitive **safety** guide for the semiconductor manufacturing industry. Examiner respectfully asserts that the guide implicitly if not expressly teaches the need for humans to have

air and to provide it during maintenance of manufacturing apparatus, since air is the most basic of needs essential for human life.

Further regarding “clean” and “dry” as descriptors for air. The instant specification fails to provide a requisite for that which “clean” and “dry” are. Accordingly, air, in general, is taken to be clean and dry, as opposed to contaminated (or dirty) and wet absent such teaching that the air is dirty and wet. Given that humans, as well as semiconductor manufacturing apparatus, require clean, dry air as opposed to contaminated, wet air, to prevent contaminating of the micrometer- or nanometer-sized array of millions of transistors formed on semiconductor devices, it is unclear how Applicant could in good faith argue that one of ordinary skill would not know to use clean, dry air. Examiner can only assume that Applicant believes, based upon Applicant's arguments provided in the present response (filed 2 December 2003), that one of ordinary skill would intentionally use contaminated or dirty, wet air --as opposed to clean dry air-- to purge a semiconductor apparatus in concert with the teachings in Semiconductor Equipment and Materials International (SEMI) publications **S2-0200**, and that use of such dirty, wet air would somehow avoid a potential hazard to a human's health or to the operation effectiveness of the semiconductor manufacturing equipment.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

Art Unit: 2813

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
25 March 2004